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Application No.: 10/731,260 Docket No.: CVZ-020

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) In a Computer Aided Design (CAD) environment, a method, comprising the steps of:

providing a model of a Micro Electro-Mechanical System (MEMS) displayed to a user in a schematic view, said MEMS model including a plurality of ~~fully~~ parameterized model components, each component having ~~based on analytical mathematical theory~~ an underlying mathematical behavioral model describing mathematically how the component reacts to stimuli;

generating a graphical three-dimensional (3D) view of said MEMS model ~~depicted by the schematic view~~ for display to the user, the generated 3D view generated directly from the MEMS model depicted in the schematic view;

performing a simulation by numerically executing the MEMS model, a result of the simulation being displayed in the 3D view so as to portray an animation of a mechanical motion of the MEMS; and

cross-referencing said 3D view and said schematic view so that changes in the 3D view are reflected in the model components depicted in the schematic view and changes in the model components depicted in the schematic view are reflected in the 3D view.

2. (Previously Presented) The method of claim 1 wherein the 3D view displays one of a shape, orientation and position of said MEMS model.

3. (Previously Presented) The method of claim 1 wherein the displayed 3D view depicts a position of at least one mechanical connection point in said model, said mechanical connection point defined by at least one parameter of at least one connected mechanical part.

4. (Original) The method of claim 1, comprising the further steps of:

selecting a model component depicted in said schematic view;

indicating visually that a model component in said schematic view has been selected; and

indicating visually a corresponding component in said 3D view.

5. (Original) The method of claim 4 wherein highlighting is used to indicate visually the selected model component in said schematic view and the corresponding model component in said 3D view.

6. (Original) The method of claim 1, comprising the further steps of:

selecting a model component depicted in said 3D view;

indicating visually that a model component depicted in the 3D view has been selected; and

indicating visually a corresponding model component in said schematic view.

7. (Original) The method of claim 6 wherein highlighting is used to indicate visually the selected model component depicted in the 3D view and the corresponding model component in said schematic view.

8. (Previously Presented) The method of claim 1, comprising the further steps of:

analyzing programmatically said MEMS model; and

indicating visually errors in said MEMS model on at least one model component displayed in said 3D graphical view.

9. (Original) The method of claim 1, comprising the further steps of:

altering said 3D view in response to a user command.

10. (Previously Presented) The method of claim 1, comprising the further steps of:

providing a 3D view generator associated with at least one model component depicted in said schematic view, said 3D view generator including information used to programmatically generate a 3D view of a model component;

analyzing programmatically said MEMS model to identify model components associated with a 3D view generator; and

using at least one of said associated view generators to create a 3D representation of said model component in said 3D view.

11. (Original) The method of claim 1, comprising the further steps of:

providing a symbolic view of the model depicted in said schematic that contains a list of component names, said list arranged in a hierarchical order of model components and sub-components.

12. (Original) The method of claim 11, comprising the further step of:

synchronizing said symbolic view with at least one of the display of said schematic view and the 3D view such that a selection of a model component in said symbolic view is visually indicated in the symbolic view and at least one of the display of the schematic view and the 3D view.

13. (Original) The method of claim 11, comprising the further step of:

synchronizing the symbolic view with at least one of the display of said schematic view and said 3D view such that a selection of a model component in at least one of the display of the schematic view and the 3D view is visually indicated in at least one of the display of the schematic view and the 3D view, and in the symbolic view.

14. (Original) The method of claim 1, wherein at least some data for said model components displayed in said 3D view is retrieved from a netlist.

15. (Previously Presented) The method of claim 1 wherein the plurality of model components in the MEMS model are selected from a MEMS component library.

16. (Currently Amended) A physical medium for use with an electronic device, the physical medium holding computer-executable instructions for ~~holding~~ a design and simulation environment, ~~the medium holding executable steps for a method,~~ said instructions comprising:

instructions for providing a model of a Micro Electro-Mechanical System (MEMS) displayed to a user in a schematic view, said MEMS model including a plurality of ~~fully~~ parameterized model components, each component ~~based on analytical mathematical theory~~ having an underlying mathematical behavioral model describing mathematically how the component reacts to stimuli;

instructions for generating a graphical three-dimensional (3D) view of said MEMS model ~~depicted by the schematic view~~ for display to the user, the generated 3D view generated directly from the MEMS model depicted in the schematic view;

instructions for performing a simulation by numerically executing the MEMS model, a result of the simulation being displayed in the 3D view so as to portray an animation of a mechanical motion of the MEMS; and

instructions for cross-referencing said 3D view and said schematic view so that changes in the 3D view are reflected in the model components depicted in the schematic view and changes in the model components depicted in the schematic view are reflected in the 3D view.

17. (Previously Presented) The medium of claim 16 wherein the graphical 3D view displays one of a shape, orientation and position of said MEMS model.

18. (Previously Presented) The medium of claim 16 wherein the displayed graphical 3D view depicts a position of at least one mechanical connection point in said MEMS model, said connection point defined by at least one parameter of at least one connected mechanical part.

19. (Previously Presented) The medium of claim 16, wherein of the instructions further comprise:

instructions for selecting a model component depicted in said schematic view;

instructions for indicating visually that a model component in said schematic view has been selected; and

instructions for indicating visually a corresponding component in said 3D view.

20. (Original) The medium of claim 19 wherein highlighting is used to indicate visually the selected model component in said schematic view and the corresponding model component in said 3D view.

21. (Previously Presented) The medium of claim 16 wherein of the instructions further comprise:

instructions for selecting a model component depicted in said 3D view;

instructions for indicating visually that a model component depicted in the 3D view has been selected; and

instructions for indicating visually a corresponding model component in said schematic view.

22. (Original) The medium of claim 21 wherein highlighting is used to indicate visually the selected model component depicted in the 3D view and the corresponding model component in said schematic view.

23. (Previously Presented) The medium of claim 16 wherein the instructions further comprise:

instructions for analyzing programmatically said MEMS model; and

instructions for indicating visually errors in said MEMS model on at least one model component in said 3D view.

24. (Previously Presented) The medium of claim 16 wherein the instructions further comprise:

instructions for altering the rendering of said 3D view in response to a user command.

25. (Previously Presented) The medium of claim 16 wherein of the instructions further comprise:

instructions for providing a 3D view generator associated with at least one model component depicted in said schematic view, said 3D view generator including information used to programmatically generate a 3D view of a model component;

instructions for analyzing programmatically said MEMS model to identify model components associated with a 3D view generator; and

instructions for using at least one of said associated view generators to create a 3D representation of said model component in said 3D view.

26. (Previously Presented) The medium of claim 16 wherein of the instructions further comprise:

instructions for providing a symbolic view of the model depicted in said schematic view that lists the component names, said symbolic view arranged in a hierarchical order of model components and sub-components.

27. (Previously Presented) The medium of claim 26 wherein the instructions further comprise:

instructions for synchronizing said symbolic view with at least one of the display of said schematic view and the 3D view such that a selection of a model component in said symbolic view is visually indicated in the symbolic view and at least one of the display of the schematic view and the 3D graphical view.

28. (Previously Presented) The medium of claim 26 wherein of the instructions further comprise:

instructions for synchronizing the symbolic view with at least one of the display of said schematic view and said 3D view such that a selection of a model component in at least one of the display of the schematic view and the 3D view is visually indicated in at least one of the display of the schematic view and the 3D view and in the symbolic view.

29. (Original) The medium of claim 16, wherein at least some data for said model components displayed in said 3D view is retrieved from a netlist.

30. (Previously Presented) The medium of claim 16 wherein said plurality of model components in said MEMS model are selected from a MEMS component library.

31. (Previously Presented) The method of claim 1, further comprising:

wherein the displayed results of said simulation are progressively altered to reflect the simulation results during different points in said simulation.

32. (Previously Presented) The method of claim 31 wherein said MEMS model includes at least one optical component.

33. (Previously Presented) The method of claim 31 wherein said MEMS model includes at least one mechanical structure.

34. (Previously Presented) The method of claim 33 wherein the simulation of said mechanical structure involves at least one of a displacement, a mode shape and a distortion of the mechanical structure.

35. (Previously Presented) The method of claim 33 wherein said MEMS model includes at least one connection between a plurality of mechanical components, said connection representing mechanical degrees of freedom of the connected mechanical components.

36. (Cancelled)

37. (Original) The method of claim 31 wherein at least one of the speed and viewing characteristics of the 3D view of the simulation results of said simulation is controlled by user-set parameters.

38. (Original) The method of claim 31 wherein said simulation is one of a circuit simulation and signal flow simulation.

39. (Previously Presented) The method of claim 31, comprising the further steps of:

associating a 3D view generator with a model component referenced by said MEMS model;

analyzing programmatically said MEMS model to identify model components associated with a 3D view generator; and

using said 3D view generator to generate the display of the simulation results.

40. (Original) The method of claim 31 wherein the different points in said simulation at which the simulation results are displayed represent at least one of a time increment, one of a series of frequencies, or a value in a series of model parameter values.

41. (Previously Presented) The medium of claim 16 wherein

the results of said simulation are progressively altered to reflect the simulation results during different points in said simulation.

42. (Previously Presented) The medium of claim 41 wherein said MEMS model includes at least one optical component.

43. (Previously Presented) The medium of claim 41 wherein said MEMS model includes at least one mechanical structure.

44. (Original) The medium of claim 43 wherein the simulation of said mechanical structure involves at least one of displacements, mode shapes and distortion of the mechanical structure.

45. (Previously Presented) The medium of claim 43 wherein said MEMS model includes at least one connection between a plurality of mechanical components, said connection representing mechanical degrees of freedom of the connected mechanical components.

46. (Cancelled)

47. (Original) The medium of claim 41 wherein at least one of the speed and a viewing characteristic of the 3D view of the results of said simulation is controlled by user-set parameters.

48. (Original) The medium of claim 41 wherein said simulation is one of a circuit simulation and a signal flow simulation.

49. (Previously Presented) The medium of claim 41 wherein the instructions further comprise:

instructions for associating a 3D view generator with a model component referenced by said MEMS model;

instructions for analyzing programmatically said MEMS model to identify model components associated with a 3D view generator; and

instructions for using said 3D view generator to generate the display of the simulation results.

50. (Previously Presented) The medium of claim 41 wherein the different points in said simulation at which the simulation results are displayed represent at least one of a time

increment, one of a series of frequencies, and one of a value in a series of model parameter values.

51. (Currently Amended) In a CAD environment, a system, comprising:

a plurality of ~~fully~~ parameterized Micro Electro-Mechanical System (MEMS) model components, each said MEMS model components including a mathematical behavioral model describing mathematically how the MEMS model component reacts to stimuli, a graphical symbol for display in a schematic view, and a three-dimensional (3D) view generator, said 3D view generator being computer code holding information necessary for the 3D display of an associated MEMS model component;

a schematic editor used to create and control a schematic view of an underlying MEMS model for display to a user, said MEMS model including a plurality of MEMS model components selected from said library of MEMS components; and

a schematic visualizer, said schematic visualizer analyzing said MEMS model to identify a plurality of MEMS components associated with said 3D view generators, said 3D view generators being used by said schematic visualizer to generate a 3D view of said MEMS model, the generated 3D view generated directly from the MEMS model depicted in the schematic view.

52. (Previously Presented) The system of claim 51, comprising further:

at least two views of said MEMS model, said 3D view of said MEMS model and a symbolic view providing a hierarchical listing of components and sub-components in said MEMS model.

53. (Original) The system of claim 52 wherein at least two of said views are cross-referenced such that the selection of a component in one view causes the indication of the selection of the corresponding component in one of said other views.

54. (Original) The system of claim 51 wherein the view characteristics of said 3D view of said model are configurable by a user.

55. (Currently Amended) The system of claim 51, comprising further:

a simulator able to simulate the execution of the MEMS model depicted in said 3D view; and

a simulation result visualizer used to display ~~simulation~~ results of a simulation generated by said simulator to said user by altering the display of said 3D view ~~of said MEMS model by altering the appearance of said 3D view to reflect different points in said simulation~~portray an animation of a mechanical motion of the MEMS.

56. (Original) The system of claim 55 wherein said simulator is one of a circuit simulator and signal flow simulator.

57. (Original) The system of claim 55 wherein the display of said simulation results to a user is configurable by a user to adjust at least one display characteristic of the simulation results.